Herbarium Library

THE ENTOPATH NEWS.

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INTRODUCTORY

A plea has come in from the Entomology section, which is also relevant to pathological material, concerning letters or minutes which accompany material. Would these bear in all cases the full address of the sender and also carry his name written legibly or printed after the signature? This will ensure that the sender will receive a copy of the reply instead of having to wait until the reply is routed through Conservancy and a copy sent to him. Frequently all we get is Mr. So and So of Such and Such Forest, and as we do not possess a list of all forest addresses, it is often impossible to correspond directly with the sender.

Meria laricis in the plantation.

Meria is probably the most important fungal disease of larch in the nursery but it has never been considered of importance in the plantation. One case was found in young thicket stage Japanese larch some years ago in Roxburghshire which at the time caused considerable defoliation but when this plantation was visited recently there were no signs of the disease.

This year, however, Meria has caused considerable browning in two larch plantations. In one, European larch, larch canker was the main agent causing death of crowns and Meria apparently was acting as a parasite of less importance in defoliating the still living shoots and hastening the decline of the trees. In this plantation many deaths have occurred but this is due to the canker and not to Meria. The second plantation contained Japanese and Hybrid larch and there was of course no canker problem, but Meria had attached the needles very severely indeed and had caused almost complete defoliation

of trees by late summer. In contrast to the first plantation no trees had died and it is anticipated that all the trees will flush again next season. The appearance of the stand had naturally caused considerable disquiet to the owner.

Little is known of the factors governing the development of a Meria attack. Infection persists on diseased needles of the previous year on the ground and it is probable that in most larch plantations there is a low resident Meria population. Possibly an attack needs to mount gradually for 2 or 3 years before reaching epidemic proportions. The factors governing this are no doubt complex, as is usual with fungal diseases but there is a suspicion that moisture shortage to the trees may favour attack. This is because the affected plantations were on sites where drainage was free and because attacks were seen in drought years or years with dry springs. One may think that in this case Meria attacks in plantations should be more common, but possibly more than a single drought year may be required. Lately, for instance, we have had a dry year in 1955 followed by dry springs in 1956 and 1957. Meria may have compounded in these three years and become epidemic this year.

There are no controls one can suggest for Meria on plantation larch though spraying is recommended for the disease in the nursery (Leaflet No. 21). The fungus is not a killer, though its defoliating effect may be important when other agencies such as larch canker or root fungi may be operating. Thicket stage larch seems to be susceptible but apparently trees can grow out of a severe attack and show little signs of it afterwards. It is very fortunate that this universally distributed fungus which can spore so profusely is capricious in its development towards epidemic level.

BUPALUS PINIARIUS - TENTSMUIR.

In issue No. 13(April), you will remember that a dangerously high Bupalus pupal count was reported from Tentsmuir, Fifeshire. Mentioned too was the intention firstly to extend the survey to discover the extent of the affected area, and secondly to follow this up with egg assessments. In all, 62 compartments were surveyed

for pupae, at the rate of 5 sq. yd. plots per compartment, and the work revealed a neatly concentrated area of high counts.

Egg assessments on the scale required on such a wide area had not been attempted before by us, but fortunately earlier more intensive work in other forests provided enough information for us to devise a practical means of doing this. Shortly, this consisted of egg counting on sample branches taken from randomly selected trees. Some guidance in interpretation of results so obtained was to be had from the figure of 2000 eggs/tree used in Germany as the critical number in decisions on whether control is necessary or not. This figure, however, takes no account of age or quality class of the trees in question and we deliberately, therefore, set our sights low, having in mind the thin poor crowns of Tentsmuir pine (the trees, in common with those on other sand dune areas, have a poor needle-holding characteristic). We took 1000 eggs/tree as our critical number. Altogether 15 compartments hit this figure and were later treated.

The control method employed the "Tifa" fogging machine, and D.D.T. was the insecticide selected for the job. Forest fogging has been developed in post-war years by the Germans, but this is the first time the method has been used in this country, other than on an experimental basis. The working of the machine is somewhat difficult to explain but, briefly, the insecticide is emitted from a distributor head or nozzle, where it is formed into a thermal fog by a forced blast of hot gasses. The fog, although thrown out with considerable force, very soon loses velocity, and dispersal thereon depends on external conditions. In the forest the practice is to drag the machine on a trailer down racks (which may have to be specially cut for the purpose), and to fog into the forest a distance of about 100 yards. The fog has to expand and travel this distance without appreciable loss through the canopy, and for this a climatic inversion from the crowns of the trees is necessary. Thus the operation must be carried out at night. In practice, it is found that a ground to air inversion of about 4° - 6°F is sufficient. Although one feels the air to be still under these conditions there is always some slight air movement, and advantage of this is taken to help the fog on its way. The movement tends to be in the direction of the prevailing wind at this time of year, but is inclined to be changeable, and the operator has, therefore, to be prepared to change the direction

of fogging at short notice. In general the plan will obviously be to proceed up wind with each successive swathe, but these changes of wind may preclude this ideal.

The advantages of fogging as a control method include its flexibility in use (the Commission own and operate their own machine) and the low cost for treatment of small areas. On the debit side are its relative slowness in operation and its reliance on very specific weather conditions. Being ground-borne, topography is also a limiting factor.

To round the Tentsmuir story off - Assessments of kill by the counting of larvae on collecting trays indicate that mortality was high; this method, however, does not give accurate figures owing to the hang-up of larvae in the crowns. Refogging of randomly selected spots in the already treated area yielded no further drop of larvae and this is perhaps a better test of control. We shall not, however, be able to pronounce finally until pupal counting has been carried out this winter. We can say, however, that it appears to be extremely good.

KEITHIA THUJINA.

Some years ago two plants of Thuja were discovered which stood out green and healthy from the brown Keithia-infected plants around them. They have since been propagated vegetatively by the Genetics branch, and a fairly large stock of plants is now available. It is hoped eventually to set up a seed orchard, the seed from which might be expected to yield at any rate a proportion of resistant plants. But to do this satisfactorily it is certainly desirable to have more than two clones. We should be grateful therefore if you could look over seedbeds, transplant lines or even hedges heavily attacked by the disease and mark any plants that are still completely healthy. If there are a lot of healthy plants it can probably be assumed that the attack is incomplete, and that the green plants have not yet been infected; but if there are only one or two healthy plants among hundreds of diseased ones the chances are quite high that they really are resistant. Any such plants should be sent during the winter to the pathologist, carefully lifted and packed, so that they can be grown on at Alice Holt, and

properly labelled with seed origin, age and supplying nursery. If you find resistant trees in hedges, just let us know and we will tell you when to send us cutting material.

In the meantime some progress with control by spraying is being made, though we are not yet in a position to put out definite recommendations. The idea of growing Thuja in isolated Keithia-free nurseries (Entopath No. 6, p.3) is proving of only limited value, as by one means or another such nurseries gradually become infected. It is interesting to note that Kinver nursery, which never imports any plants of any kind from outside is one of the nurseries that is still Keithia-free. The same policy is being adopted at Maelor, the new North Wales nursery, and the behaviour of Thuja there will be followed with interest.

Mr. Pawsey, who is working on the fungus at Nottingham University (Entopath No. 10, p. 1), considers that the disease cannot exist long in the absence of Thuja. An infected nursery therefore ought to become clean again after one, or at most two, years without Thuja plants in it, unless there are infected trees in the vicinity. We are going to try out the idea, therefore, of rotating Thuja crops over a chain of six or seven suitable nurseries, sowing Thuja in a fresh nursery each year and raising only one crop in each nursery. Even assuming that the plants went out as 2 + 2s, this would mean that the first nursery would be free of Thuja for two or three years before it was once again in its turn used to raise the Thuja crop.

SALT IN THE AIR.

Both in 1956 and 1957 we have had summer gales, which have carried salt spray far inland and in some areas produced obvious scorching of tree foliage, particularly that of beech. The spray which travels furthest is apparently that picked up by the wind in aerosol form from the breaking bubbles in the waves, and this can travel as an invisible mist many miles inland. At fairly high elevations in places exposed to off-sea winds, damage has been found as much as fifty miles from the sea; so that theoretically much of Britain is liable to such damage. However most of the injury occurs within 10-12 miles of the coast, and acute damage is limited to a belt 2 - 3 miles wide along it. Topography has a

great effect on damage. For instance in the gale of July 1956 practically no damage was found on the north slope of the South Downs near Brighton, although that area is only a few miles from the sea.

The symptoms of salt spray injury closely resemble those caused by industrial fumes. In broadleaved trees there is scorching of the margins and between the veins of those leaves not completely withered. In the case of conifers the tips of the needles are browned.

There are wide differences in susceptibility between different trees, evergreens being generally more resistant than deciduous trees. Some trees with hairy leaves such as the White poplar, Populus alba, are also very resistant to salt spray.

Salt spray damage is often clearly visible immediately after a summer gale; but the long term effect of such damage is inevitably confused with damage due to ordinary exposure, for both types of damage are likely to occur in the same place and therefore to the same trees. It is often impossible, when trees are growing badly and showing twig dieback in exposed areas near the sea, to decide how much of the injury is due to the straight blast effect of the wind, and how much to the salt carried in it.

TREES IN ORKNEY

A recent holiday in Orkney provided an opportunity to have a look at the few trees that do exist in that nearly treeless land. Unfortunately time did not allow a visit to the Forestry Commission trial plantings on the island of Hoy, but it seems almost certain that they will eventually run into exposure difficulties, as do all the other trees on these windswept isles. None of the trees seen looked really healthy, and most of them showed substantial dieback owing to exposure and probably also to salt. The effects of exposure to sea winds certainly outweigh and mask any other pathological agencies that may also be at work.

Only in the most sheltered valleys or by planting in considerable depth can anything like true woodland conditions be established.

In fact there are really only two proper woods in the islands, one at Binscarth on the Mainland, as the largest island is called, and one sheltering Balfour House on Shapinsay. Both are predominantly of sycamore, which is far the most successful tree over the islands as a whole. The Binscarth woods are enriched with other species, such as ash and elm, and even with plantings of conifers. Young larch, Scots pine and Sitka spruce grow well as long as they are in shelter, for the frost free season is very long indeed, even if summer temperatures are low. As the crowns are exposed however, progress becomes extremely slow.

The upper end of the Binscarth wood illustrates very clearly indeed the common story of failure of trees following increased exposure. About half of this area was blown down a few years ago when the islands were subject to phenomenally violent gales. The remainder of the trees including some Sitka spruce which made very good growth in youth, are now dying back rapidly as a result of the suddenly increased exposure.

Very few conifers have been planted. Only Scots pine, Pinus contorta, European larch and Sitka spruce were seen. If it were not for exposure and difficulties of transport what an excellent site these islands would make for raising Keithia free Thuja, or possibly Meria free larch.

Sclerophoma on Scots pine Needles.

For some time we have had under observation a disease of pine characterised by the drooping and shedding of the current year's needles. Pairs of needles turn brown at the base and collapse. Eventually when they fall they hang inverted on the healthy needles beneath. The damage usually becomes obvious during the late summer, and by autumn the affected needles are covered with the tiny black lumpy fruit bodies of the fungus Sclerophoma pithyophila, clearly distinguishable from those of the more widespread Lophodermium pinastri which at this time are no more than tiny slits.

Misled by the universal presence of the fungus, we at first assumed that it was the sole cause of the trouble, but recently our attention was drawn to the possibility of insects being involved. Counts made on material from two infected stands in Norfolk have shown that in fact a very high percentage of the affected pairs of needles bore the tiny burrows of the Pine gall midge, Cecidomyia baeri, between the needles at the base. It is at this point also that the fungus is first found. It certainly appears as if the fungus were following and possibly extending the initial damage done by the insect, but further work will be required before we can be certain of this, and before we can know whether Sclerophoma is always dependant on the insect, or can attack on its own.

Dr. Rishbeth of Cambridge University, who is working on Fomes annosus, has found that conifer foliage makes quite a good spore trap, so that he can discover what spores are present in the air of any particular site by washing them off conifer needles and identifying them. It is of some interest that he has found the spores of Sclerophoma to be commoner in Thetford Chase than those of any other fungus.

REMINDER!!!

Specimens and Descriptions to be sent direct to either the Pathologist or the Entomologist, the minute preferably being in the package with the material.

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